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JOSEPH LE CONTE, the most honored and beloved of American men of science, professor of geology and natural history in the University of California, the author of important contributions to geology, natural history, psychology and education, president in 1892 of the American Association for the Advancement of Science, president in 1896 of the Geological Society of America, one of the editors of this Journal, died in the Yosemite Valley, on July 6, at the age of eighty-eight years.



# SCIENCE

A WEEKLY JOURNAL DEVOTED TO THE ADVANCEMENT OF SCIENCE, PUBLISHING THE  
OFFICIAL NOTICES AND PROCEEDINGS OF THE AMERICAN ASSOCIATION  
FOR THE ADVANCEMENT OF SCIENCE.

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FRIDAY, JULY 19, 1901.

## CONTENTS:

<i>A Century of Civil Engineering:</i> DR. J. JAMES R. CROES .....	83
<i>The British National Antarctic Expedition:</i> .....	94
<i>Teaching Chemistry in Schools:</i> DR. RUFUS P. WILLIAMS .....	100
<i>Scientific Books:—</i>	
<i>Turneure and Russell on Public Water Supplies:</i> PROFESSOR MANSFIED MERRIMAN. <i>Willey's Zoological Results:</i> DR. G. H. PARKER. <i>Lühe's Ergebnisse der neueren Sporozoenforschung:</i> DR. C. W. STILES.....	104
<i>Scientific Journals and Articles</i> .....	107
<i>Societies and Academies:—</i>	
<i>Physics at the American Association. Section of Biology of the New York Academy of Sciences:</i> PROFESSOR HENRY E. CRAMPTON.....	108
<i>Discussion and Correspondence:—</i>	
<i>The Washington Memorial Institution:</i> DR. W J MCGEE. <i>The Royal Society of Canada:</i> DR. H. M. AMI. <i>A Horned Lizard at a High Altitude:</i> PROFESSOR T. D. A. COCKERELL .....	111
<i>Shorter Articles:—</i>	
<i>The Geologic Distribution of Pollicipes and Scalpellum:</i> DR. F. A. BATHER.....	112
<i>Quotations:—</i>	
<i>The Salaries of Scientific Men in the Employment of the Government. The National University Project</i> .....	112
<i>A New Mammalian Genus</i> .....	114
<i>The New Bureau of Forestry</i> .....	115
<i>Scientific Notes and News</i> .....	116
<i>University and Educational News</i> .....	119

## A CENTURY OF CIVIL ENGINEERING.\*

THE century which has just passed, the nineteenth of the Christian era, is distinguished from any of the preceding hundred-year periods in the world's history by the advances made in the cooperation of investigators in numerous branches of science in the formulation of doctrines regarding the nature and coordination of natural phenomena, which stand the test of experiment and calculation, thus leading to a nearer approximation to the understanding of the laws which govern such phenomena, and so to the development into a profession of the 'Art of directing the great sources of power in Nature for the use and convenience of Man,' which Art is entitled Civil Engineering. This definition is itself one of the most noteworthy products of the Nineteenth Century, and a study of the sequence of events and reasoning which led to its formulation is not without interest.

Ever since man became endowed with consciousness and the power of reasoning, he has been striving to solve the problems of the physical world around him in which he perceived matter in motion, which was evidenced to his senses by sight and touch, by sound and taste and smell, but which was devoid of sentience, so far as he could

\* President's address before the American Society of Civil Engineers at the Annual Convention at Niagara Falls, N. Y., June 25, 1901. *Transactions Am. Soc. C. E.*, XLV., 599.

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merous zoological and medical articles published in different languages and in different parts of the world.

First he gives a discussion of the general life cycle of the coccidia. This is followed by a classification of the coccidia. Chapter II. discusses the life cycle of the malaria plasmodium, while Chapter III. is given up to a general discussion of the more recent results in the other groups of Sporozoa. Taken as a whole, the material is well digested, and makes an excellent summary for any one who wishes to inform himself quickly regarding the most recent results in investigations concerning Sporozoa.

The work contains 35 illustrations, which add to a proper understanding of the text. One of the great difficulties in following the articles of the present day on the Sporozoa is the fact that so many different authors have considered it necessary or advisable to introduce so many new terms designating the different stages of development. If, for instance, we compare Ross's articles of 1898 with those of 1899 or 1900, we find different terms used for the same stage. Ray Lankester in 1900 uses still other terms; Harvey Gibson an entirely different terminology; while Grassi has repeatedly changed his technical terms. One almost needs a separate dictionary to-day to understand the literature on the Sporozoa. Lühe has in the main followed the terminology adopted by Schaudinn, 1899, and he gives a table by which it is possible to follow the terminology adopted by most of the other authors.

So far as the coccidia are concerned, Lühe's discussion compares quite favorably with the recent summary given by Rafael Blanchard in the *Société zoologique de France*, but it certainly is not superior to Blanchard's work in either style or presentation; in fact, it would be very difficult to improve on Blanchard's article. Lühe's discussion of the malaria parasite compares very favorably with the discussion recently published by Blanchard, Laveran and others in the French Academy of Medicine, but in addition to the abstract discussion of the life cycle of the parasite, he gives a general historical introduction to the subject, with a review of recent literature, and

makes an effort to establish the priority of certain discoveries. We are somewhat surprised to miss in this introduction all reference to the valuable contribution by Dr. King, of Washington, who was apparently the first author to give a scientific summary of the reasons in favor of the view of the transmission of malaria by mosquitoes.

Chapter III. assumes on the part of the reader a certain amount of knowledge of the groups discussed.

One point in connection with the work we can hardly leave unmentioned, and that is the antiquated method of citing literature. Each group has its own bibliography arranged alphabetically by authors. This results not only in unnecessary repetition, but also in confusion; for instance, Max Braun's treatise on animal parasites of man is No. 2 in the first bibliography, No. 12 in the second bibliography, and No. 2 in the third. The work would be greatly improved if the Harvard system of bibliography had been adopted.

C. W. STILES.

#### SCIENTIFIC JOURNALS AND ARTICLES.

THE May number of the *Bulletin of the American Mathematical Society* contains the following articles: 'Non-Oscillatory Linear Differential Equations of the Second Order,' by M. Bôcher; 'Concerning Real and Complex Continuous Groups,' by L. E. Dickson; 'On Holomorphisms and Primitive Roots,' by G. A. Miller; Reviews of Graf and Gubler's Bessel Functions II., by V. Snyder, and of Ricci's Theory of Surfaces, by H. S. White; 'Notes'; 'New Publications.' The June number contains reports of the April meeting of the Society, by E. Kasner, and of the April meeting of the Chicago Section, by T. F. Holgate; 'The Value of a Certain Integral,' by F. Morley; 'On the Algebraic Potential Curves,' by E. Kasner; Review of Steinmetz's Alternating Current Phenomena,' by J. B. Whitehead, Jr.; and of de Tannenberg's Applications of the Calculus to Geometry, by L. P. Eisenhart; 'Notes'; 'New Publications.' The July number, concluding Volume 7 of the *Bulletin*, contains: 'Surfaces whose First and Second Fundamental Forms are the Second and First Respectively

of Another Surface,' by L. P. Eisenhart; 'On Groups Generated by Two Operators,' by G. A. Miller; 'A Curious Approximate Construction for  $\pi$ ,' by G. Peirce; Review of Manning's Non-Euclidean Geometry, by J. L. Coolidge, and of Bianchi's Differential Geometry, by J. K. Whittemore; 'Notes'; 'New Publications'; 'Tenth Annual List of Papers Read before the Society and Subsequently published'; and a sixteen-page Index of the Volume.

*The Popular Science Monthly* for July opens with an important article on 'The Transmission of Yellow Fever by Mosquitoes,' by George M. Sternberg, detailing the long and careful series of experiments which seem to clearly point out the mosquito as the active agent in the spreading of this disease. Incidentally it may be noted that no less than eighteen men voluntarily exposed themselves to the disease in order to test the theory of its diffusion. Under 'Climate and Carbonic Acid,' Bailey Willis discusses the evidence in favor of the theory that the glacial epochs have been caused by the absorption of carbonic dioxide from the atmosphere, permitting the radiation of heat and lowering the temperature of the earth's atmosphere. A translation is presented of the article on 'The Peopling of the Philippines,' by Rud. Virchow, and Havelock Ellis continues his 'Study of British Genius,' this instalment being devoted to pathology, from which it appears that there is a special connection between genius and gout. Edward L. Thorndike treats of 'The Intelligence of Monkeys,' deciding that they carry the animal method of learning beyond a point reached by any other of the lower animals. 'Cocaine Analgesia of the Spinal Cord' is discussed by Smith Ely Jelliffe, and Henry A. Pilsbry considers 'The Evidence of Snails on Changes of Land and Sea,' while Frank Waldo describes the work of 'The Blue Hill Meteorological Observatory,' which he considers the most successfully conducted meteorological observatory in America. The final article is on the organization and aims of 'The American Association for the Advancement of Science' apropos of its coming meeting in Denver. There is much in-

teresting reading to be found in 'The Progress of Science.'

IN *The American Naturalist* for June, W. M. Wheeler presents the first part of a paper on 'The Compound and Mixed Nests of American Ants.' Glover M. Allen describes 'The Louisiana Deer' as a subspecies under the name of *Odocoelus virginianus louisianæ*. It is a rather curious fact that the antlers of the type of the subspecies and of the two forms shown for comparison are all abnormal. R. W. Shufeldt gives an excellent paper 'On the Osteology and Systematic Position of the Screamers' (*Pala-medæa: Chauna*), in which their points of agreement and disagreement with the ducks and fowls are well shown. 'Normal Respiration and Intramolecular Respiration' are discussed by George J. Peirce, and Abram V. Mauck contributes an article 'On the Swarming and Variation in a Myriapod' (*Fontaria virginensis*). The fifteenth instalment of the fine series of 'Synopsis of North American Invertebrates' is by Hubert L. Clark and is devoted to the Holothuriodea. 'Editorial Comment' and the customary reviews complete the number.

*The Auk* for July is mostly devoted to systematic papers: 'Bendire's Thrasher,' by Herbert Brown; 'Birds of the Black Hills,' by Merritt Cary; 'Unpublished Letters of William MacGillivray to John James Audubon,' by Ruthven Deane; 'The Resident Land Birds of Bermuda,' by Outram Bangs and Thomas S. Bradlee, containing descriptions of several new species; 'A New Ground Dove from Western Mexico,' by Outram Bangs; 'The Monterey Hermit Thrush,' by Joseph Grinnell; 'The Winter Birds of Pea Island, North Carolina,' by Louis B. Bishop, a list of 42 species, and 'A New Sharp-tailed Finch from North Carolina,' by Louis B. Bishop. The 'General Notes' and 'Reviews of Recent Literature' are very full.

#### SOCIETIES AND ACADEMIES.

##### PHYSICS AT THE AMERICAN ASSOCIATION.

THE officers of section B, Physics, Professor De Witt B. Brace, chairman, and Professor John Zeleny, secretary, have received the following titles of papers for presentation at the